Common Fractures

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Finger

MALLET FINGER (Baseball Finger)

- Avulsion of Extensor Digitorum Communis (EDC) Tendon from DIP joint
- PITFALL – get the films
  - Can be associated with Avulsion Fracture

Common Fractures

- Distal Upper Extremity
  - Fingers, Hand, Wrist
- Proximal Upper Extremity
  - Humerus, Shoulder, Clavicle
- Proximal Lower Extremity
  - Hip, Femur
- Distal Lower Extremity
  - Knees, Ankle, Feet

Finger

MALLET FINGER

- Mechanism of Injury:
  - Direct jam
  - Forced flexion
  - Dorsal dislocation of PIP
  - Laceration
  - Splint
    - Slight hyperextension for 6 weeks
    - Night splint for additional 6 weeks
    - Best results if treated early
Jersey Finger

- A pop or rip felt in the finger at the time of the injury
- Pain when moving the injured finger and the inability to bend the last joint
- Tenderness, swelling and warmth of the injured finger
- Bruising after 48 hours
- Occasionally a lump felt in the palm of the finger

Finger

JERSEY FINGER

- Avulsion injury of Flexor Digitorum Profundus (FDP) from volar base of distal phalanx
- Examination:
  - FDP test - blocked flexion of DIP
  - Treatment - early surgical repair
  - Permanent disability if missed

Neuro Hand Sensation

ulnar
radial
median
**Boxer’s Fracture**

**DEFINITION**
- Distal neck fx of 5th metacarpal
- Volar displacement acceptable to 45 degrees for office casting +/- closed reduction
- Rotation deformity
- More than minimal valgus or varus displacement
- Referral
- PITFALLS – missing a fight bite
Metacarpal Bones

BENNETT’S FRACTURE
- Intra-articular fx at base of 1st metacarpal
- Wide displacement due to pull of FPL
- Fragment held in place by strong ligament

Thumb Immobilization
- Thumb Spica Splinting

Wrist & Hand Injuries
- Scapholunate Ligament Injury
  - Most common and most crucial ligament injury of wrist.
  - Often leads to chronic pain and/or functional instability.

PITFALL – Only looking for fractures
### Scapholunate Ligament Injury


### Wrist Injuries

- Triquetral Fractures
  - Second most common fracture
  - PITFALL – not looking at Lateral film
“Wrist” Injuries

- Distal radius/ulna injury patterns
  - Colle’s fractures
  - Smith’s fractures (reverse Colle’s)
  - PITFALL- R,M,U disruption 8%

Supracondylar Fracture

- Mechanism: fall on flexed elbow
- PITFALL;
  - median nerve injury
  - Brachial artery injury

Elbow Fractures

- Radial Head Fracture
  - Sail Sign
  - PITFALL-
  - No boney abnormality, no fracture

Humerus Fractures
<table>
<thead>
<tr>
<th>Humerus Fractures</th>
<th>Clavicle Fracture</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PITFALL - Radial Nerve</td>
<td>• PITFALLS</td>
</tr>
<tr>
<td>• Transection</td>
<td>▪ CHECKING FOR VASCULAR INTEGRITY</td>
</tr>
<tr>
<td>• Neuropraxia</td>
<td>▪ ASSOCIATED INJURIES</td>
</tr>
<tr>
<td></td>
<td>▪ SKIN TENTING</td>
</tr>
</tbody>
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<th>Clavicle Fracture</th>
<th>Shoulder Dislocations</th>
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- Shoulder Dislocations: 
  - [Image of shoulder dislocation]
Shoulder Dislocations

- Anterior
  - Most common
    - Scaphoid deformity
    - Flexed and adducted
- Posterior
  - Seizures
  - PITFALL – not controlling seizures
- Inferior/Thoracic

Knee Injuries

- Seizures

Hip Fractures

- PITFALLS
  - Recognizing Occult fractures
  - Addressing high morbidity

Knee Injuries

- Patella Alta - PITFALL
- Patellar fractures – PITFALL – check extensor mechanism
Common Knee Fractures

Other Common Knee Fractures

Mechanism of Ankle Injury

- Inversion + Plantarflexion= 80% sprains
  - Most commonly involve the Anterior Talofibular Ligament.
- Inversion or Eversion alone
- Landing on unsteady object
- Change of Direction
  - Deceleration associated
- Manual Twisting
  - Wrestling injury

Ankle Fractures

- Bi and Tri malleolar fractures
- Mortis disruption

Ankle Fractures

- PITFALL
  - Examining the joint above and below
**Proximal 5th Metatarsal Palpation**

- Test of 5th Metatarsal Avulsion
  - Occurs most commonly with inversion
  - Peroneus Brevis pulls styloid off of 5th Metatarsal
  - PITFALL - Palpate at styloid for pain.
    - If positive for pain should X-ray.

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**Common Fractures in Orthopedics**

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**5th Metatarsal Fractures**

- Jones versus pseudo Jones
  - PITFALL – nonreferral of Jones

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**Adult Common Fractures Objectives**

1. Recommend an approach to the evaluation of patients who present with a fracture
2. Identify operative and non-operative injuries commonly seen in orthopedics
3. Describe basic surgical treatment options for fractures
4. Understand goals of surgery and what your patients can expect during post operative period
Evaluation

• Patients age
• History
  – Time of injury
  – Mechanism of injury
  – “What hurts”
• Medical History
• Surgical History
• Social Hx (occupation)
• Medications (anticoagulation)
• Smoking/Alcohol history

Clinical Evaluation

• Need to closely exam the soft tissues around the fracture
• Look for openings in the skin – which may indicate an “open” fracture
• Abrasions? Amount of swelling? Presence of fracture blisters?

Physical Examination

• Look for deformity
• Palpate areas of tenderness
• Examine the joint above and below
• Detailed neurologic and vascular examination

Clinical Evaluation

• Soft tissue care
  – Primary goal is to halt continuing trauma to the tissues
  – Treatment of fractures first begins with “reducing” the fracture or dislocation
  – Immobilizing the fracture with a splint or external fixation
Clinical Evaluation

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Imaging Studies

- Some instances plain x-rays do not define the fracture well
  - Joint injuries with multiple fragment => CT scan
  - Occult fractures

Imaging Studies

- Radiographic assessment of fractures
- Begins with plain x-rays
  - 2 views at least
  - AP (anteroposterior) and lateral views
  - Joints above and below as some of the energy can be absorbed at a site away from the injury

Special Studies

- Elderly patients with hip pain => MRI can diagnose an occult hip fracture
- Occult Fractures
  - Bone Scan
    - Sensitivity 100% @ 72hrs
  - MRI
    - Sensitive in first 24 hrs
Now that we have a diagnosis, where do we go from here?
Fractures that require surgical intervention

• “Open” fractures
• Irreducible fractures or dislocations
• Displaced intra-articular fractures
### Fracture Healing
- In general all adult fractures take 6-8 weeks to heal with or without surgical intervention
- Some fractures have longer healing times
  - Open fractures
  - Fractures in patients with diabetes
  - Intra-articular (joint) fractures
  - Fractures in bones with poor blood supply (scaphoid, talus, tibia)

### Goals of Surgery
- Decrease pain
- Fix fracture/Replace with prosthesis
- Early return to function
- Early mobility – PT/Strengthening/ROM
- Return to work
- Return to life

### Primary Goals
- Immobilize (let soft tissues relax)
- Pain control
- Ice and elevation
- Upper extremity – sling
- Lower extremity – crutches/walker
- Urgent orthopedic follow up

### Examples of Common Fractures
Metacarpal Fractures

- ~3% of all fractures
- >50% work related
- Less frequent, MVC, recreation, household injuries
- Border digits most common

Metacarpal neck fractures

- Extra-articular fx
  - Some angulation, shortening accepted (more in little/ring, less with index/long fingers), but rotation need to be corrected
- “Boxer’s fracture”
  - Ulnar gutter splint 10-14 days

Evaluation

- Physical exam
  - Range of motion
  - Rotational deformity
  - Associated soft-tissue injury
  - Neurovascular examination

Distal Radius Fractures

- Common sites of injuries
- Most common fx of the UE
- 8-17% all bony injuries
Classification
Fracture Pattern

Classification
Fracture Pattern

Stable
Amenable to closed reduction and casting treatment

Unstable
Requires definitive fixation to achieve/maintain Radiographic parameters
Common Fractures

- Clavicle fractures
  - Vast majority heal with simple immobilization with sling for comfort
  - Begin early range of motion (1-2 weeks)
  - 6-8 weeks back to full activities
Proximal humerus fractures

- 4-5% of all fractures
- Most fxs (80-85%) min displaced
- Bimodal distribution
  - Young high energy injury
  - Older pt, low energy injury, osteoporotic bone

Common Fractures about the hip

- Displaced or Non-displaced
- Femoral neck fracture
- Intertrochanteric
- Hip fracture
Incidence

- 250,000 Hip Fractures/year
- Double by 2040 to 500,000

Etiology

- Osteoporosis
- Low energy fall
- 90% >65y/o
- Peak @ 80y/o
- F>M
- High energy fxs – More rare
Femoral neck fractures

Intertrochateric Hip Fractures

Why fix?

- Early mobilization
  - WBAT POD 1
  - Prevents prolonged bedrest
  - Decreased bed sores
  - Decreased pneumonia
  - Decreased pain
- Function
  - 40% Pre-Injury Ambulatory Status

References:
Osleoparos Int. 2000;11(12):1018-23
Fractures around the knee

- Supracondylar / intracondylar distal femur fractures
- Tibial plateau fractures
- “Joint” or “intra-articular” fractures
  - Recommend surgical ORIF for majority of fractures due to joint involvement

Fractures around the knee

- Longer period of NWB (typically 3 months) postoperatively due to joint fixation
- Early range of motion to prevent knee contractures

Foot and Ankle Fractures

- Foot and ankle trauma is common
- 25% of all traumatic injuries
- Significant time loss from work
  - Foot required for walking
Nonoperative Treatment

- Indicated for some isolated lateral malleolus fractures
  - WBAT in fracture boot
  - Early ROM exercises / PT
  - Takes ~6-8 weeks to heal

Metatarsal Fractures

- Treatment usually nonoperative
- Symptomatic:
  - Hard shoe
  - Walking cast
  - Elastic bandage

Ankle fractures

- Surgical intervention indicated for
  - Medial malleolus fractures
  - Bimalleolar and trimalleolar fractures
- Patients instructed to be non-weight bearing for 8 weeks after surgery (longer if associated ligamentous injury)
- 3-6 month recovery time

Lisfranc Injuries

- Up to 40% overlooked on initial radiographs
- High index of suspicion
- Xrays may show minimal displacement vs complete disruption
Take Home Points

- Begin with thorough clinical evaluation
- Obtain appropriate radiographs
- Splint/Immobilize
- Patients should be prepared for a “long” recovery time
- Surgery provides early ROM, predictive healing, better functional outcome